EMPIRIC ANTIBIOTIC PROPHYLAXIS IN REVISION ARTHROPLASTY

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Abstract

Infection remains one of the most challenging complications of joint arthroplasty. The risk of such infections is higher in revision arthroplasties and in patients who have had prior operative procedures on the affected joint.

First generation cephalosporins such as Cephalothin are widely used as the prophylactic antibiotic for primary joint arthroplasty procedures, however there are no studies which demonstrate their efficacy in revision arthroplasty.

The objectives of this study are to characterise the spectrum and antibiotic susceptibility of bacteria isolated from revision hip and knee arthroplasty specimens in order to make recommendations regarding the choice of empiric antibiotic therapy in the peri-operative period, prior to definitive culture results being available to the surgeon.

The microbiology laboratory at The Prince Charles Hospital prospectively collected the culture results from revision surgeries on previous hip and knee arthroplasty from January 1999 to August 2006. The data was then retrospectively analysed to look at the causative organisms and their patterns.

Over the period of study there were 147 patients identified who had positive intra-operative cultures on specimens taken at the time of revision arthroplasty of the hip or knee joints. Positive isolates included 195 tissue culture specimens, 43 fluid specimens and 10 swabs collections yielding 248 positive isolates. 140 of the isolates were obtained from re-operations on hips and 108 from knees.

Gram-positive organisms accounted for the majority of isolates but a wide variety of organisms were cultured. Staphylococcus species was the most common group of organisms encountered, identified in 52.8% (131) of the 248 positive cultures. Coagulase-negative staphylococcus accounted for about two thirds of this group and Staphylococcus aureus only about one third. Gram negative organisms accounted for about 25% of the isolates.

Of all the specimens isolated, only 38.7% were sensitive to Cephalothin. Only 34.6% of the most common isolate (coagulase-negative staphylococcus) was sensitive to cephalothin. No gram positive organism vancomycin resistance was detected.

Gentamicin had good activity against Gram-Negative isolates including coliforms and Pseudomonas aeruginosa.

The success of antibiotic prophylaxis relates to the susceptibility of bacteria encountered during the procedure. The results of this study suggest that Cephalothin alone is an inappropriate empiric prophylactic antibiotic regimen for revision hip or knee arthroplasty. We recommend that empiric antibiotic prophylaxis for revision hip and knee procedures should include vancomycin to cover Gram positive organisms. Intravenous gentamicin is a suitable agent for most Gram negative bacteria. Antibiotic prophylaxis should be continued for a period of 4 post-operative days until specimen isolates remain negative.